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PHOTOGRAPHIC INTELLIGENCE REPORT

[redacted]

TA-LIEN (DAIREN) NITROGEN FERTILIZER PLANTS

CHINA

Declass Review by NIMA/DOD

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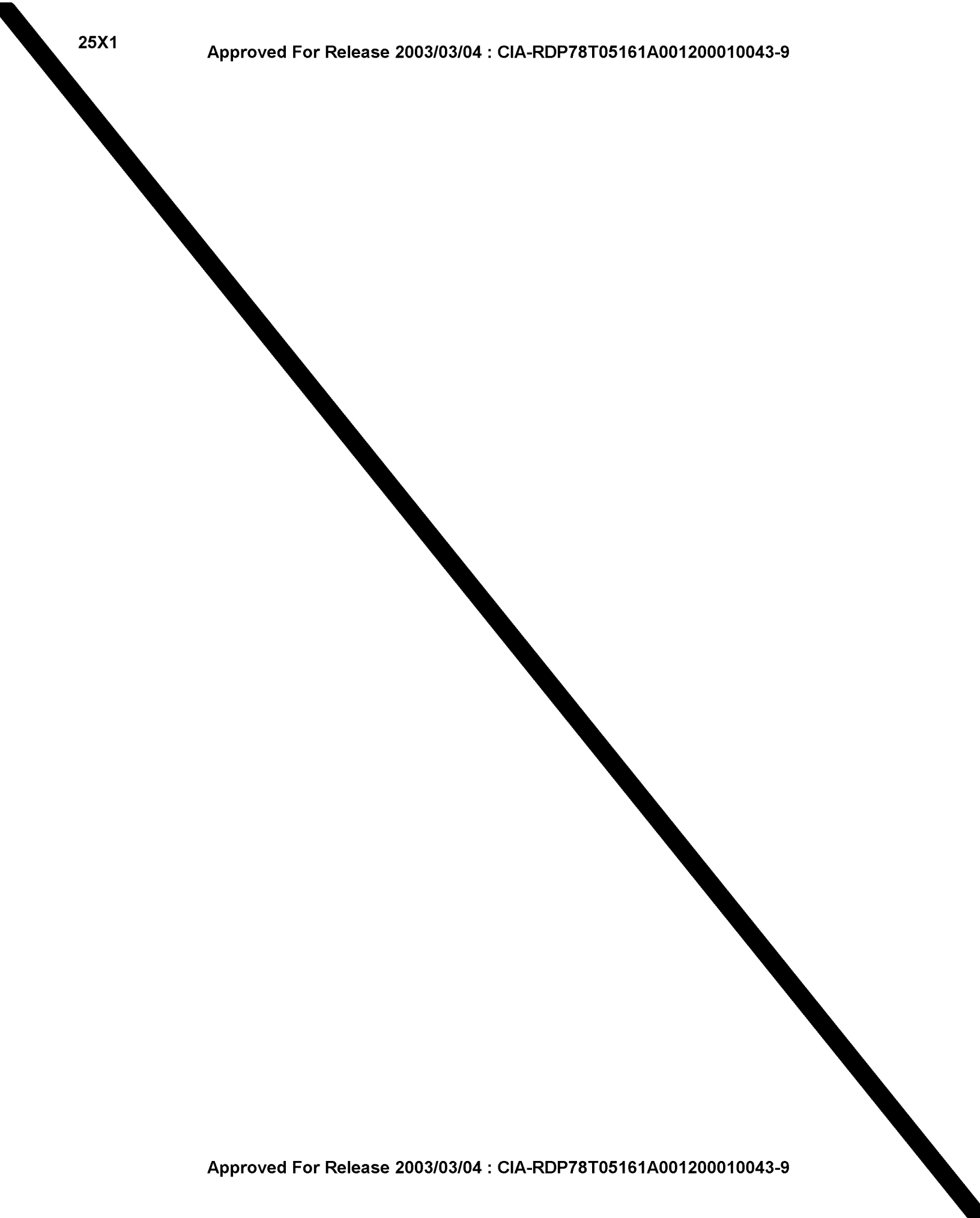

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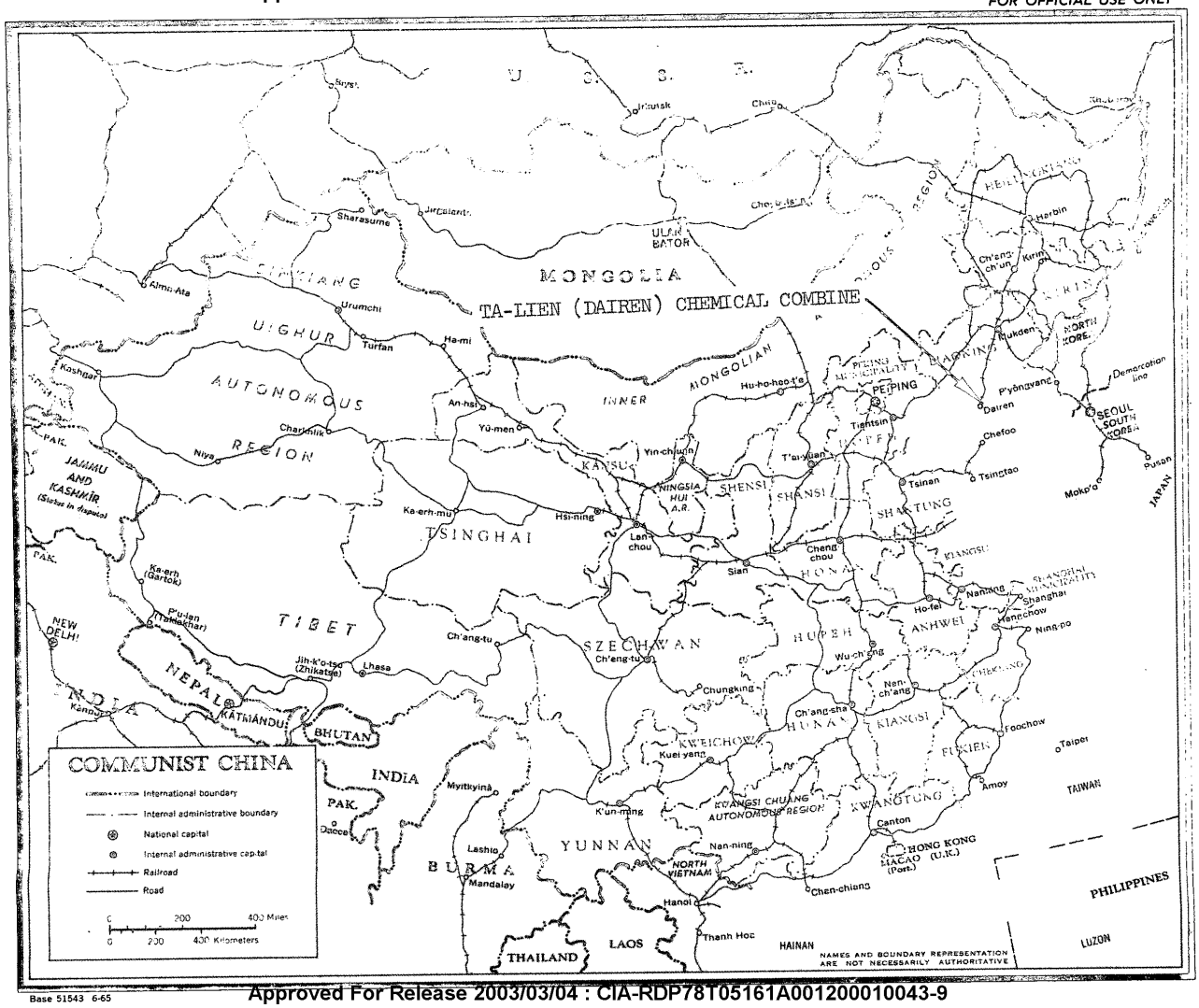

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PIR - 75060
FIGURE 1

25X5

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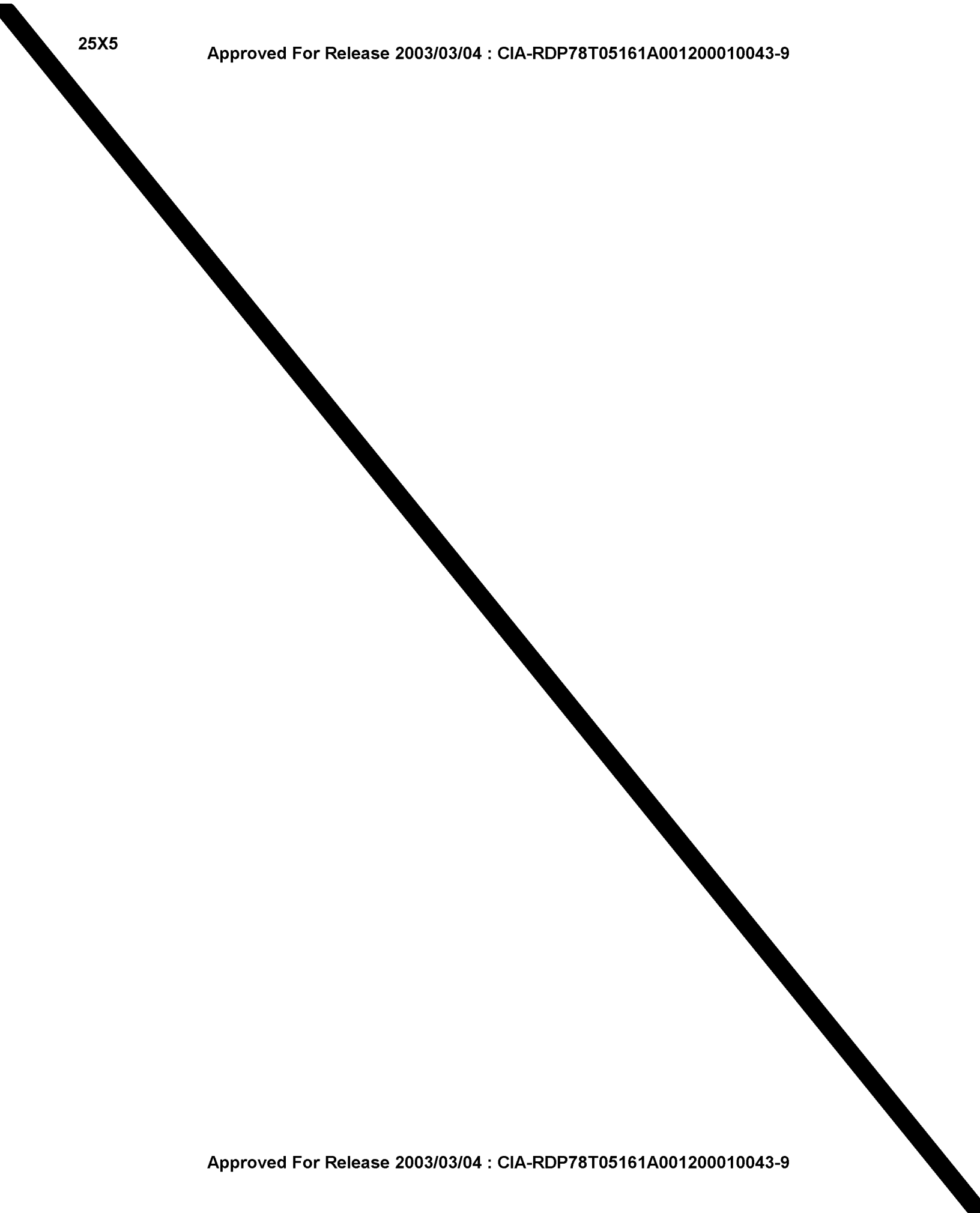

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TA-LIEN (DAIREN) NITROGEN FERTILIZER PLANTS
CHINA

The Ta-lien (Dairen) nitrogen fertilizer plants are components of the large Ta-lien Chemical Combine Kan-ching-tzu which produces soda ash, caustic soda, sulfuric acid, nitric acid, synthetic ammonia, at least two types of nitrogenous fertilizer, and several other lesser products.

The chemical combine is rail, road and water served; and is located approximately three nautical miles north-northeast of the center of the Ta-lien complex at the geographic coordinates 38 57N - 121 37E.

The types of chemical fertilizer produced at the combine include ammonium sulfate and probably both liquid and granular ammonium nitrate. Also, because of the abundant supply of available ammonia, ammonium chloride fertilizer probably could be produced economically as a by-product of the soda ash production.

The following is a brief discussion of the various areas within the combine which are associated with the fertilizer production, and is keyed to the annotated Figure 4.

Hydrogen for the synthesis of ammonia is obtained by the destructive distillation of coal in the gas production area (Area C). Feed stock for the retorts (5) is obtained from the coal storage (1) and/or the coke ovens (3). Enrichment of the hydrogen content of the raw gas from the retorts is accomplished first in the reform unit (7) where methane is broken down to form hydrogen and carbon monoxide and then in the contact ovens (9) where steam and carbon monoxide are reacted to form additional hydrogen and carbon dioxide. The produced gas is processed in the desulfurizing units (8 and 11) and in the purification units (12) for the removal of sulfur and carbon dioxide and a relatively pure hydrogen is obtained.

The ammonia production area (Area D) contains two compressor/ synthesis and converter buildings (13 and 15) for the compounding of ammonia from hydrogen and nitrogen. A possible reactor building (17) for the production of liquid ammonium nitrate is also located in this area. Railroad tank cars were observed on several missions near the handling and shipping point (18) for aqueous ammonia and possibly liquid ammonium nitrate.

Pipelines from the ammonia production area can be traced on photography into the two nitric acid plants (Area E). Each of these acid plants contain an ammonia oxidization building (19 and 24) and a series

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of absorbers (20 - high pressure absorbers, and 25 - low pressure absorbers). Nitric oxide formed by the oxidization of ammonia is combined with air or oxygen, and these gases are piped into the absorbers where nitrogen dioxide is formed and absorbed in water to produce dilute nitric acid. Part of this acid is shipped directly from the combine, and part of it is used in other production areas within the combine.

The ammonium nitrate production area (Area F) a production/granulation building (29) where ammonia and dilute nitric acid are combined and then dried and granulated to form fertilizer. Also, included is a storage and shipping building (30). As previously stated, with respect to fertilizer production, a possible reactor building (17) for the compounding of liquid ammonium nitrate is located in the ammonia production area (Area D).

A large chamber sulfuric acid plant (Area G) produces acid of varying concentrations from pyrite ore. The plant appears to be more or less typical with the usual ore handling facilities (31), roaster building (32) and converter and tower section (33). Acid from this plant is shipped direct, piped to the nearby steel plant, and used in other production areas within the combine.

The ammonium sulfate production area (Area H) contains a reactor building (36) where ammonia and sulfuric acid are combined to form fertilizer, a fertilizer warehouse (37), and a probable storage and shipping building (38) which could also be directly associated with the sulfuric acid plant.

The remaining production areas within the chemical combine have not been broken down in detail. However, a third possible source of chemical fertilizer could be from the recovery of ammonium chloride as a by-product at the soda ash plant (Area J). Ordinarily, the ammonia used in the soda ash process is recovered after the ammoniated brine has been carbonated and the sodium bicarbonate has been precipitated and filtered. The abundant supply of ammonia available from within the combine might possibly enable the economic use of the residual liquid from the process for the production of ammonium chloride fertilizer.

25X1 Throughout the entire time span covered by this study, production activity at this chemical combine has been carried on at a very high level. No significant construction, except the modification of certain existing buildings, was observed during the period from [redacted] 25X the production and storage buildings (29 and 30) in the ammonium nitrate production area (Area F) were greatly modified. Prior to these modifications, the area possibly was used for purposes other than the production of ammonium nitrate fertilizer.

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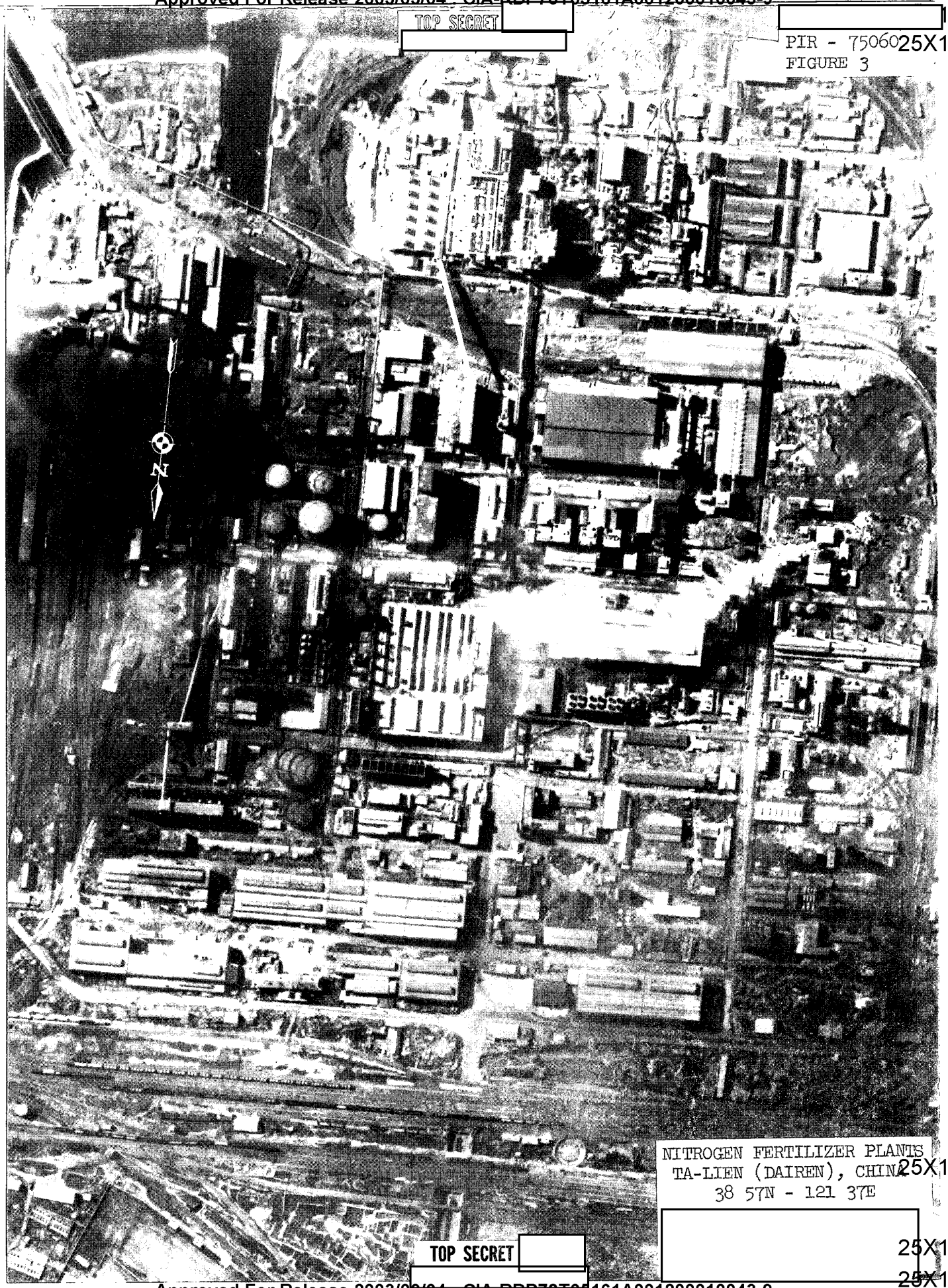
PIR - 75060 25X1
FIGURE 3



NITROGEN FERTILIZER PLANTS
TA-LIEN (DAIREN), CHINA 25X1
38 57N - 121 37E

25X1
25X1

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AREA A - Coal Storage and Processing Area

1. Coal stockpile
2. Coal processing building
3. Coke ovens
4. Conveyor system

AREA B - Coal By-Products Area

AREA C - Gas Production Area

5. Retort building
6. Raw gasholders
7. Reform units
8. Desulfurization units
9. Contact ovens
10. Gasholders
11. Probable desulfurization units
12. Purification units

AREA D - Ammonia Production Area

13. Compressor/synthesis and converter building
14. Gasholder
15. Compressor/synthesis and converter building
16. Cooling towers
17. Possible ammonium nitrate reactor building
18. Aqueous ammonia and possibly liquid ammonium nitrate handling and shipping point

AREA E - Nitric acid production area (2 plants)

19. Ammonia oxidization building
20. High pressure absorbers
21. Storage tanks
22. Gasholder
23. Cooling tower
24. Ammonia oxidization building
25. Low pressure absorbers
26. Cooling tower

AREA F - Ammonium nitrate production area

27. Acid storage tanks
28. Gasholder
29. Production and granulation building
30. Fertilizer warehouse

AREA G - Sulfuric acid plant

31. Ore processing and storage building
32. Roaster building
33. Chambers and tower section
34. Acid storage tanks
35. Storage area for waste and/or pyrite ore

AREA H - Ammonium sulfate production area

36. Reactor building
37. Fertilizer warehouse
38. Storage and shipping building

AREA I - Concentrated nitric acid plant

AREA J - Soda ash plant

AREA K - U/I processing area

AREA L - Caustic soda plant

AREA M - Support and storage area

AREA N - U/I fabrication plant

AREA O - Administration, storage and support area

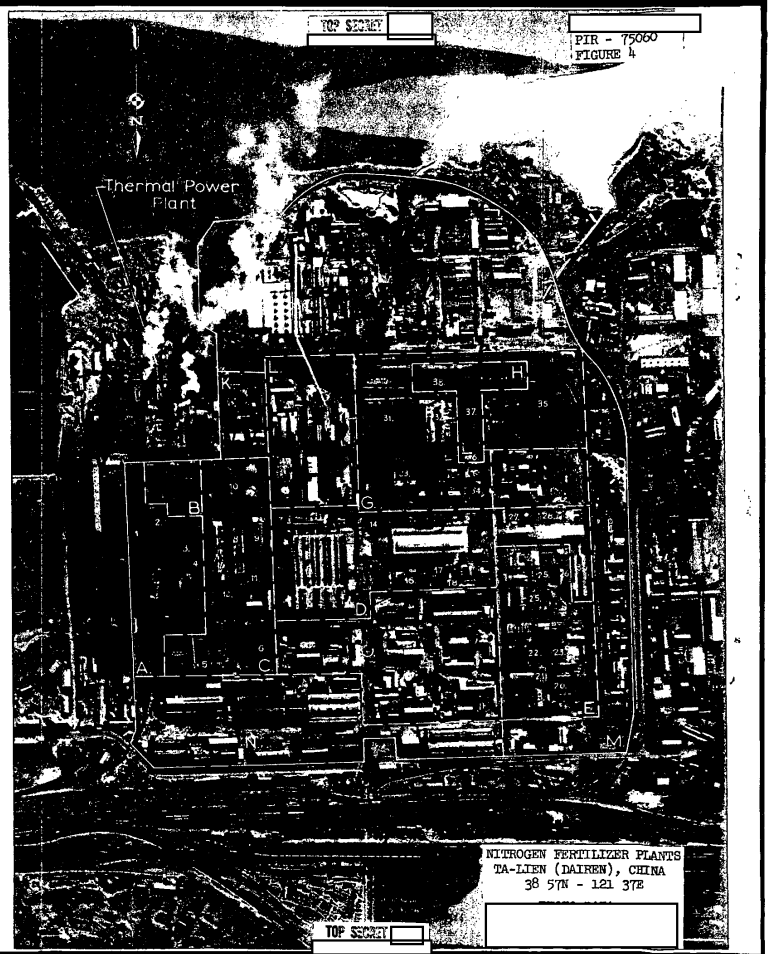

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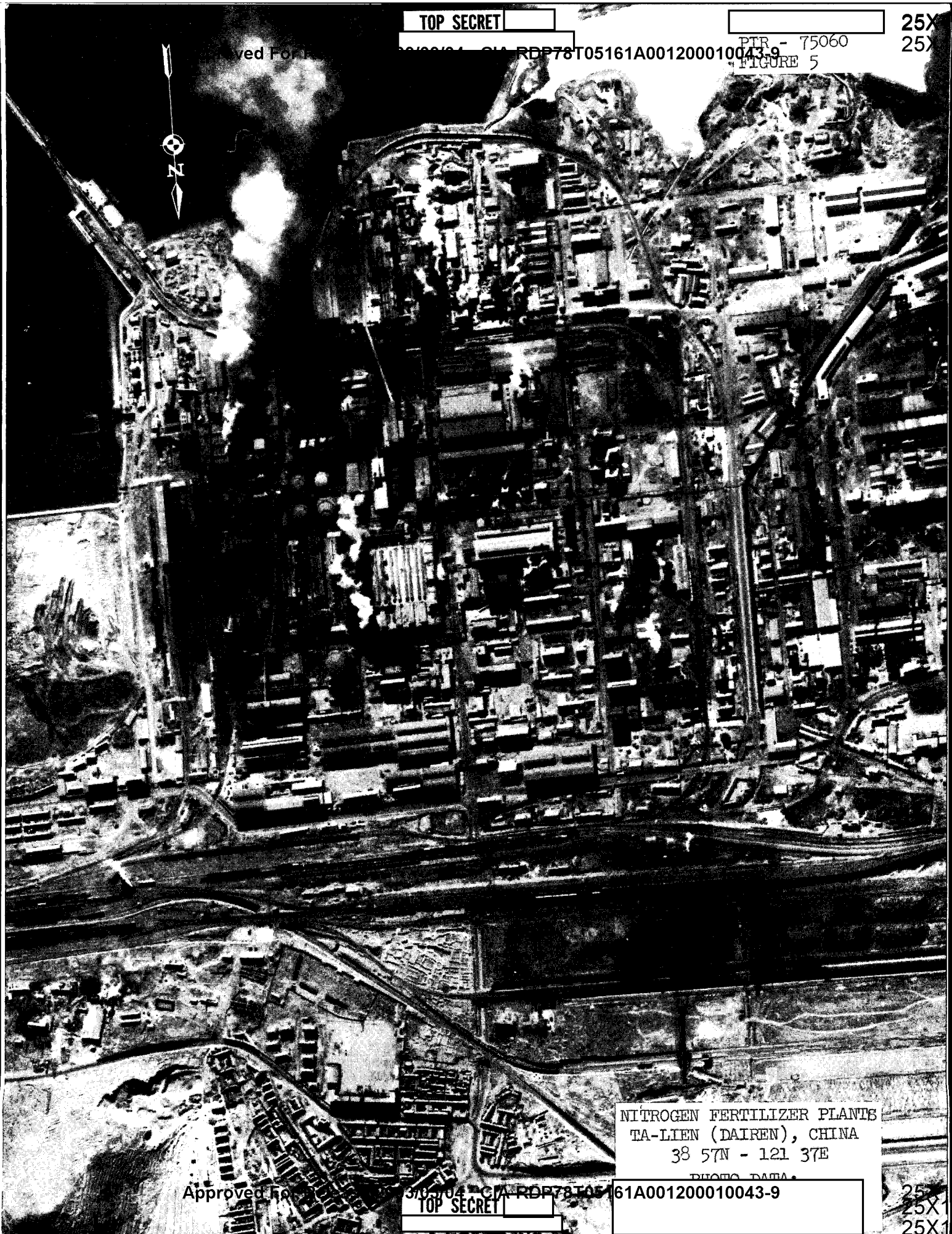
FIGURE 5



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TA-LIEN (DAIREN), CHINA
38 57N - 121 37E
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MAPS AND CHARTS

General Locator Map, China - Base 51543, 6-65 (Official Use Only)

U.S. Air Target Chart, Series 200, Sheet 0381-9HL, 2nd Edition, December 1963 (SECRET)

U.S. Air Target Chart, Series 200, Sheet 0381-10HL, 2nd Edition, August 1963 (SECRET)

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